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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/072,579	02/06/2002	Min-Goo Kim	678-804 (P10162)	1798

28249 7590 01/18/2006

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EXAMINER	
TORRES, JOSEPH D	

ART UNIT	PAPER NUMBER
2133	

DATE MAILED: 01/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/072,579	KIM ET AL.	
	Examiner	Art Unit	
	Joseph D. Torres	2133	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-3 and 5-7 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 1-3 and 5 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claims 1-3 and 5 are directed to an abstract algorithm for generating sub-codes or matrices representing sub-codes with no apparent tangible connection to any useful hardware or utility connected to any hardware. Note: claim 6 is **not** rejected under 35 U.S.C. 101 because it explicitly recites, "transmitting data using a sub-code in the selected sub-code set". The Examiner suggests adopting similar language in claims 1-3 and 5 where applicable.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1, 3, 6 and 7are rejected under 35 U.S.C. 103(a) as being unpatentable over Eroz; Mustafa et al. (US 6370669 B1, hereafter referred to as Eroz) in view of Gibbs; Jonathan A. et al. (US 6711182 B1, hereafter referred to as Gibbs).

35 U.S.C. 103(a) rejection of claim 1.

Eroz teaches generating sub-code sets with given code rates, each sub-code belonging to one sub-code set having the same code rate and each sub-code set having a different code rate (Note: a sub-code of a turbo code or convolutional code is entirely defined by the turbo code or convolutional code and the puncturing pattern or matrix used to generate the sub-code, that is, the puncturing pattern or matrix for a particular turbo code or convolutional code entirely defines the sub-code and hence substantially is the sub-code; Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes).

However Eroz does not explicitly teach the specific use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes.

Gibbs, in an analogous art, teaches use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes (col. 1, lies 28-43 in Gibb teach the uses unequal error protection based on the priority of information bits, that is, the particular priority of a sub-code is determined from the priority of the bits that it is used to encode; the Abstract and Figure 1 in Gibbs teaches that the transmitted data corresponding to a particular priority is rearranged for transmission maintaining the relative prioritization).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eroz with the teachings of C by including use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes would have provided a means for preparing data from multiple sources (col. 2, lines 57-60 in Gibbs).

35 U.S.C. 103(a) rejection of claim 3.

Eroz teaches generating new sub-code sets, a representative matrix for each sub-code in each new sub-code set having as many columns as the least common multiple of the numbers of columns of each sub-code in the sub-code sets (Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes; Note: the number of columns in all of the matrices in Figure 16 is four and hence four is the least common multiple of the number of columns in all of the matrices in Figure 16); and

determining priority of the matrixes of sub-codes in each new sub-code set so that a matrix generated by combining matrixes from two of the new sub-code sets has a Quasi-complementary turbo code characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; Note also all of the codes in Figure 16 of Eroz are complementary; hence Quasi-complementary), a higher priority assigned to a more desirable QCTC characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; best is a highest priority), and rearranging the matrixes in each new sub-code according to the priority, wherein the QCTC characteristic are the elements of the matrix that have a uniform distribution of repetition and puncturing (The matrices in Figure 16 of Eroz provide for uniform distribution; see 1602,1604, 1606,...).

35 U.S.C. 103(a) rejection of claim 6.

Eroz teaches generating sub-code sets with given code rates, each sub-code belonging to one sub-code set having the same code rate and each sub-code set having a different code rate (Note: a sub-code of a turbo code or convolutional code is entirely defined by the turbo code or convolutional code and the puncturing pattern or matrix used to generate the sub-code, that is, the puncturing pattern or matrix for a particular turbo code or convolutional code entirely defines the sub-code and hence substantially is the sub-code; Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes).

However Eroz does not explicitly teach the specific use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes.

Gibbs, in an analogous art, teaches use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes (col. 1, lies 28-43 in Gibb teach the uses unequal error protection based on the priority of information bits, that is, the particular priority of a sub-code is determined from the priority of the bits that it is used to encode; the Abstract and Figure 1 in Gibbs teaches that the transmitted data corresponding to a particular priority is rearranged for transmission maintaining the relative prioritization). Note also: matrices are a means for storing information on a sub-code.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eroz with the teachings of C by including use of

rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes would have provided a means for preparing data from multiple sources (col. 2, lines 57-60 in Gibbs).

35 U.S.C. 103(a) rejection of claim 7.

Eroz teaches generating new sub-code sets, a representative matrix for each sub-code in each new sub-code set having as many columns as the least common multiple of the numbers of columns of each sub-code in the sub-code sets (Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes; Note: the number of columns in all of the matrices in Figure 16 is four and hence four is the least common multiple of the number of columns in all of the matrices in Figure 16); and

determining priority of the matrixes of sub-codes in each new sub-code set so that a matrix generated by combining matrixes from two of the new sub-code sets has a Quasi-complementary turbo code characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; Note also all of the codes in Figure 16 of Eroz are complementary; hence Quasi-complementary), a higher priority

assigned to a more desirable QCTC characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; best is a highest priority), and rearranging the matrixes in each new sub-code according to the priority, wherein the QCTC characteristic are the elements of the matrix that have a uniform distribution of repetition and puncturing (The matrices in Figure 16 of Eroz provide for uniform distribution; see 1602,1604, 1606,...).

4. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eroz; Mustafa et al. (US 6370669 B1, hereafter referred to as Eroz) and Gibbs; Jonathan A. et al. (US 6711182 B1, hereafter referred to as Gibbs) in view of Moulsley; Timothy J. (US 6671851 B1).

35 U.S.C. 103(a) rejection of claim 2.

Eroz and Gibbs substantially teaches the claimed invention described in claim 1 (as rejected above).

However Eroz and Gibbs does not explicitly teach the specific use of repetition.

Moulsley, in an analogous art, teaches use of repetition or puncturing matrices for generating the repetition or punctured sub-codes taught in Park (see Figure 2 in Moulsley).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eroz and Gibbs with the teachings of Moulsley by including use of repetition. This modification would have been obvious to one of

ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of repetition would have provided a means for rate matching.

35 U.S.C. 103(a) rejection of claim 5.

Eroz teaches generating sub-code sets with given code rates, each sub-code belonging to one sub-code set having the same code rate and each sub-code set having a different code rate (Note: a sub-code of a turbo code or convolutional code is entirely defined by the turbo code or convolutional code and the puncturing pattern or matrix used to generate the sub-code, that is, the puncturing pattern or matrix for a particular turbo code or convolutional code entirely defines the sub-code and hence substantially is the sub-code; Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes).

However Eroz does not explicitly teach the specific use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes.

Gibbs, in an analogous art, teaches use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes (col. 1, lies 28-43 in Gibb teach the uses unequal error protection based on the priority of information bits, that is, the particular priority of a sub-code is determined from the priority of the bits that it is used to encode; the Abstract and Figure 1 in Gibbs teaches that the transmitted

data corresponding to a particular priority is rearranged for transmission maintaining the relative prioritization). In addition, Eroz teaches generating new sub-code sets, a representative matrix for each sub-code in each new sub-code set having as many columns as the least common multiple of the numbers of columns of each sub-code in the sub-code sets (Figure 16(a) in Eroz teaches a set of 1/3 rate sub-codes and Figure 16(b) in Eroz teaches a set of 1/2 rate sub-codes; Note: the number of columns in all of the matrices in Figure 16 is four and hence four is the least common multiple of the number of columns in all of the matrices in Figure 16); and

determining priority of the matrixes of sub-codes in each new sub-code set so that a matrix generated by combining matrixes from two of the new sub-code sets has a Quasi-complementary turbo code characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; Note also all of the codes in Figure 16 of Eroz are complementary; hence Quasi-complementary), a higher priority assigned to a more desirable QCTC characteristic (see col. 11, lines 1-20 in Eroz; Note: the best codes ere the codes with the highest priority; best is a highest priority), and rearranging the matrixes in each new sub-code according to the priority, wherein the QCTC characteristic are the elements of the matrix that have a uniform distribution of repetition and puncturing (The matrices in Figure 16 of Eroz provide for uniform distribution; see 1602,1604, 1606,...).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eroz with the teachings of C by including use of rearranging an order of the sub-codes of a sub-code set with a same or different code

rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of rearranging an order of the sub-codes of a sub-code set with a same or different code rate that is to be used after a sub-code with a predetermined code rate according to a priority of the sub-codes would have provided a means for preparing data from multiple sources (col. 2, lines 57-60 in Gibbs).

However Eroz and Gibbs does not explicitly teach the specific use of repetition.

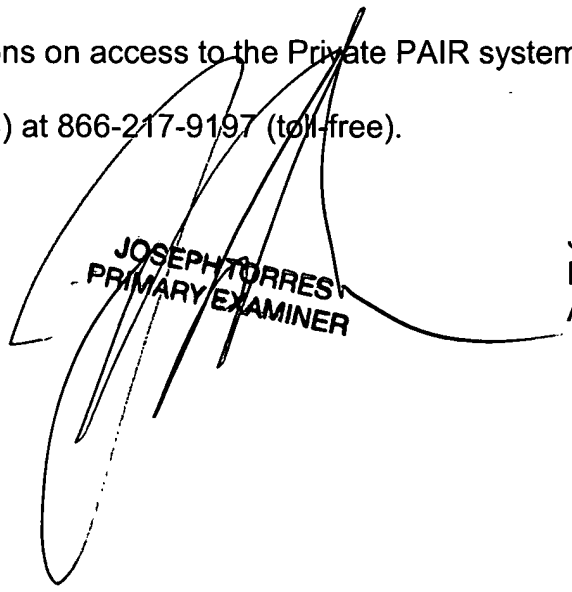
Moulsley, in an analogous art, teaches use of repetition or puncturing matrices for generating the repetition or punctured sub-codes taught in Park (see Figure 2 in Moulsley).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Eroz and Gibbs with the teachings of Moulsley by including use of repetition. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized that use of repetition would have provided a means for rate matching.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph D. Torres, PhD
Primary Examiner
Art Unit 2133